UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
OFFICE OF REGIONAL COUNSEL
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604

FACSIMILE TRANSMISSION

Date:	July 19, 2001
FAX Recipient:	Betsy Gates MPCA
FAX Number:	(651) 282-6247
FAX Sender:	Mary McAuliffe U.S. EPA, Region 5
My Phone:	(312) 886-6237
My FAX Number:	(312) 886-0747
Subject:	Met
Pages:	5 + cover

Message:
Betsy,
If you have any thoughts or concerns about this proposal, I would very much appreciate hearing from you prior to Monday, July 30th. Thank you very much!

DORSEY & WHITNEY LLP

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June 20, 2001

Mary McAuliffe
U.S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3507

RE: Metropolitan Council Supplemental Environmental Project

Dear Mary:

I have enclosed the supplemental information on fabric filter technology you requested. As you recall, the Metropolitan Council ("Met Council") has proposed using fabric filters instead of a dry electrostatic precipitator ("ESP") to accomplish the Supplemental Environmental Project ("SEP") outlined in Appendix C of its Consent Decree with the United States of America. Fabric filters will enhance particulate removal from the Met Wastewater Treatment Plant ("WWTP") incinerator and provide the additional benefit of significantly increased mercury reductions. The estimated cost is expected to be approximately the same for both technologies.

As the attached letter from Met Council's consultant outlines, using fabric filters in the fluidized bed incinerator and air pollution control train will result in better particulate removal efficiencies than the dry ESP because the filter is less sensitive to fluctuations in gas stream conditions, variations in particle size and variations in physical parameters, such as the resistivity of particulate matter. Fabric filters, combined with upstream carbon injection, should be able to provide greater mercury removal than the dry ESP because mercury adsorption can occur in both the reaction chamber and on the fabric filter.

The fabric filter considered for the project is a woven fiberglass material with a polytetrafluoroethylene finish. The finish provides a coating on the filter that improves cleanability and reduces residual dust buildup on the fabric. The total cost for the dry ESP technology is $2,108,000, compared with $2,144,000 for the fabric filter technology.

Now that you have the supplemental information on the project, we hope you will be able to complete your internal review and approve this modification expeditiously. As we noted in our previous correspondence, Met Council believes that this change may be effected by written agreement of Met Council and the EPA without the need for Court involvement, though we would provide the Court a copy of any such agreement. I will follow up with a telephone call to discuss the next appropriate steps once you have had a chance to review the supplemental information with your technical staff.

Very truly yours,

Robert E. Cattanach

WW:djs
Enclosure

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CH2MHILL

May 31, 2001

Mr. Harold Voth
Metropolitan Council Environmental Services
Metro Plant Engineering
2450 Childs Road
St. Paul, MN 55106

Subject: Replacement of Dry ESP with Fabric Filter

Dear Mr. Voth:

CH2M HILL has reviewed and concurs with the Von Roll recommendation to replace the dry electrostatic precipitator (ESP) with a fabric filter in the fluidized bed incinerator and air pollution control trains. The fabric filter technology would be an enhancement to the MCES voluntary mercury reduction program while providing better particulate removal capability.

Particulate Removal Performance

The fabric filter should result in better particulate removal efficiencies than the dry ESP because it is less sensitive to fluctuations in gas stream conditions, variations in particle size or variations in physical parameters, such as resistivity of the particulate matter. Performance data from both a fabric filter supplier and dry ESP supplier being considered for this project were evaluated. The collection efficiency versus particle diameter for each supplier's equipment is summarized as follows:

	Collection Efficiency (%)	
Particle Diameter (microns)	Dry ESP	Fabric Filter
0.3 – 1	91.3 – 93	>99
1 – 3	93 – 99	100
3 – 5	>99	100
>5	>99	100

Fabric filter removal efficiency below 0.3 microns is not reported because the fabric filter is not designed to provide significant removal of submicron particles. Particles below 0.3 microns approach the pore size opening of the fabric resulting in reduced collection efficiency. The downstream wet scrubber and wet ESP provided on the air pollution control trains are, however, designed to remove submicron particles.

Based on this data, the fabric filter offers superior performance for particles greater that 0.3 microns as compared to the dry ESP. The specified performance requirements for the air pollution control train include a maximum particulate matter emission rate of 0.1 lbs per dry ton solids incinerated. Von Roll will guarantee this performance for an air pollution control train that includes either the dry ESP or the fabric filter.

Enhanced Mercury Reduction

In addition to providing better particulate removal efficiency down to the 0.3-micron level, fabric filters provide a greater potential for increased mercury removal efficiency when combined with upstream carbon injection. Carbon injection followed by a dry ESP requires that mercury adsorption onto carbon particles occurs in a reaction chamber. The electrostatically charged carbon particles are then collected and removed in the dry ESP. In the fabric filter, however, mercury adsorption can occur in both the reaction chamber and on the fabric filter. A layer of carbon will develop on the fabric filter surface and improve the adsorption efficiency between the carbon and the mercury.

The advantages of the fabric filter for mercury control are discussed for municipal waste combustors in the *EPA Mercury Study Report To Congress, Volume VIII: An Evaluation of Mercury Control Technologies and Costs (EPA-452/R-87-010), December 1997.* The report states:

> "With activated carbon injection, efficient distribution of the carbon in the flue gas is also important. The amount of carbon needed to achieve a specific level of mercury removal will vary depending on the fuel being burned, the amount of carbon inherent to the system and the type of particulate matter control device. At a given carbon feed rate, a fabric filter provides more mercury control than an ESP because of the additional mercury adsorption that occurs on the bags of the fabric filter (due to the increased gas contact time). Mercury is predominately removed upstream of an ESP-equipped facility where a nominal residence time of 1 second or less is available, limiting the capture. In addition, mercury is not effectively collected across the ESP further requiring substantially higher carbon feed rates than the fabric filter equipped facilities."

We believe carbon injection followed by a dry ESP will provide up to 70 percent mercury removal efficiency, whereas carbon injection followed by a fabric filter should be able to achieve up to 90 percent mercury removal.

Fabric Filter Quality

The fabric filter material being considered for this project is a woven fiberglass material with a polytetrafluoroethylene (PTFE) finish. The proposed inlet operating temperature range to the fabric filter is 287°F to 350°F, which is below the 500°F maximum temperature rating of the fiberglass fabric material. The PTFE finish provides a slick coating on the filter to improve cleanability and reduce residual dust buildup on the fabric.

Cost

The cost of adding a fabric filter was evaluated and compared to the cost of adding a dry ESP to one air pollution control train. The cost estimate results are summarized as follows:

	Cost	
Item	Dry ESP	Fabric Filter
Equipment	$595,000	$650,000
Mechanical Installation	$135,000	$153,000
Electrical Installation	$140,000	$93,000
Additional ID Fan Capacity	-	$10,000
Additional Required Building Space	$1,238,000	$1,238,000
Total	$2,108,000	$2,144,000

If you have any questions please feel free to contact us at (651) 688-8100.

Sincerely,

CH2M HILL

John Borghesi, P.E.
Project Engineer

Peter Burrowes, P. Eng.
Principal Technologist

Confirmation Report

Page : 001
Date & Time: 07-19-01 01:43pm
Line 1 : 312 886 7160
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Nbr.	Job	Date	Time	Duration	pgs	To	Dept.nbr	Account	Comm. code	Status
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